

## NOTES.

THE retirement of Mr. Charles Whitehead from the position of the Technical Adviser to the Board of Agriculture has led to a reconsideration of the means by which the Board obtain technical advice on questions relating to agricultural botany and economic zoology, and it has now been arranged that the scientific and expert assistance required by the Board in connection with these subjects will be furnished respectively by the Royal Botanic Gardens, Kew, and by the Natural History Departments, South Kensington.

THE Paris correspondent of the *Times* states that at the sitting of the Academy of Sciences on Monday M. Becquerel, whose father and grandfather were also men of science, was warmly congratulated on having received the Rumford medal of the Royal Society. The Academy also elected, by forty-six votes to ten, M. Painlevé in the section of geometry to the seat left vacant by M. Darboux.

DR. ALLAN MACFADYEN, director of the Jenner Institute, has been elected Fullerian professor of physiology at the Royal Institution.

By a decision of the House of Lords, the Institution of Civil Engineers has been exempted from payment of the Corporation Tax (1894). In view of this fact it is submitted that the Royal Colleges of Physicians in London and Edinburgh may reasonably claim similar treatment; and we learn from the political notes in the *Times* that an attempt is being made by Sir John Tuke to induce the Chancellor of the Exchequer to concur in this view. The especial hardship in this case is that, notwithstanding the important part played by the two colleges in administering and regulating medical education and examination, and in maintaining laboratories for original research, and the obligation upon each Fellow to pay a stamp duty of 25% on election, there will be five years of arrears to make up if the authorities persist in their intention to levy the tax.

THE following are among the lecture arrangements at the Royal Institution, before Easter:—Sir Robert Ball, six lectures (adapted to young people) on great chapters from the book of nature; Prof. J. A. Ewing, six lectures on practical mechanics (experimentally treated); Dr. Allan Macfadyen, four lectures on the cell as the unit of life; Dr. Arthur Willey, three lectures on the origin of vertebrate animals; the Right Hon. Lord Rayleigh, six lectures on sound and vibrations. The Friday Evening Meetings will begin on January 18, when a discourse will be delivered by Prof. Dewar on gases at the beginning and end of the century. Succeeding discourses will probably be given by Prof. G. H. Bryan, Prof. J. J. Thomson, Sir W. Roberts-Austen, Mr. W. A. Shenstone, Dr. Horace Brown, and others.

TWENTY-THREE papers, several of them of a highly important character, were read at a meeting of the U.S. National Academy of Sciences, held at Brown University, on November 13-14. Among novel subjects of general scientific interest brought before the meeting we notice the following:—An account of the study of growing crystals by instantaneous microphotography, by Prof. T. W. Richards; stereographic projection and some of its possibilities from a graphical standpoint, by Prof. S. L. Penfield; report of progress made with the Echelon spectroscope, and the spectrum of sodium in a magnetic field, by A. A. Michelson; the explanation of inertia and gravitation by means of electrical phenomena, by Prof. H. A. Rowland; male preponderance (Androrhopy) in Lepidopterous insects, by A. S. Packard; exhibition of certain novel apparatus; a wave machine; an expansion lens; a recording system of two degrees of freedom; a tube showing coloured cloudy condensation, by Dr. C. Barus; recent observations of the planet Eros, by Prof. E. C. Pickering.

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SOME valuable additions have recently been made to the equipment of the observatory of Salò, in Lombardy. They include several recording meteorological instruments, different forms of seismoscopes, a great seismometrograph, and a limnograph for registering the seiches in Lake Gardo, the observatory being situated on its western shore.

A DOUBLE explosion, resulting in the loss of three lives, occurred on November 28 at the Smokeless Powder Works at Trimley, near Ipswich; the first in the mixing house, where 125 pounds of explosive material were being prepared, and the second in the drying house, which contained a large quantity of gun-cotton. The entire factory, consisting of a series of isolated sheds and a boiler house, was almost razed to the ground, the debris being scattered over the adjoining fields. The concussion was felt at Ipswich and Rendlesham House, near Wickham Market, which are about eight and twelve miles respectively from the scene of the disaster, and also, it is said, at other places outside a radius of fifteen miles.

THE seismological observatory of Quarto-Castello, near Florence, is one of the most completely furnished so far as regards apparatus provided with mechanical means of registration (see *NATURE*, vol. lxii., p. 200). Several instruments have been added during the past year, and the older ones have received some improvements in detail. Mr. D. R. Stiattesi, the director of the observatory, has just printed his second seismographic bulletin, that for the year November 1, 1899, to October 31, 1900. This valuable pamphlet contains details of the records by the different instruments of no fewer than 135 earthquakes. Its publication within a month of the date of the last entry is a feature worthy of imitation. Dr. G. Pacher has also issued the second part of the seismographic bulletin of the University of Padua for March 19 to June 30, 1899. The records at this observatory are obtained by means of the micro-seismographs designed by Prof. G. Vicentini, more than half (sixteen out of twenty-nine) being those which are characteristic of distant shocks.

IN our Norwegian contemporary, *Naturen*, published in Bergen, Dr. Hans Rensch, director of the Geological Survey, notices some geological investigations of great interest which have been made by a young scientific Icelandic, Mr. Helgi Pjetursson. According to this observer, Iceland shows that the Glacial period has had several subdivisions separated from each other by ice-free periods, as has been demonstrated to be the case in the Alps and other similar regions.

DR. REUSCH draws attention in *Naturen* to the changes of level that have taken place in Iceland in recent geological times, viz., since the Ice age. He points out that on a hydrographic map of the North Atlantic Ocean there is shown a submarine ridge under shallow water, which stretches from the Faroe Isles to Iceland and thence over to Greenland. North and north-east of it lies the deep Norwegian Sea. During the Norwegian Atlantic expedition there were found, strewed over the bottom, shells of Arctic mollusca, which at present live in a considerably colder climate and in much shallower water than that which prevails in the Norwegian Sea. Mr. H. Friele directed attention to that fact, and he suggested that the shells had been carried out to the deep sea by drifting ice. It ought, at the same time, to be remembered that Prof. G. O. Sars had found, off the Romsdal coast, in very deep water, shallow water shells and rolled pebbles, and he inferred that this was evidence that sinking of the seabottom had taken place there. In 1896 the Danish Ingolf Expedition investigated the sea-bottom between Ian Mayen and Iceland. In examining the dredged material, Herr A. S. Jensen made the observation that almost everywhere over the bottom of the deep ocean lie shells of dead molluscs of well-known

shallow water forms side by side with deep water forms. It was very remarkable to dredge up, from depths of 500 to 1300 fathoms, *Yoldia arctica*, which now lives at Spitsbergen and in the Kara Sea at depths from 5 to 100 fathoms. Dr. Reusch suggests that these remains of Arctic life-forms cannot have been carried there by drifting ice, but that the sea-bottom, in comparatively recent times, during the Ice age, must have been much nearer the sea-level than now. At that time the Arctic shallow water forms must have lived there *in situ*, then a sinking of the sea-bottom has taken place which can be estimated at not less than about 2500 metres. It is easy to see that these results of the Danish naturalist have an important bearing upon the phenomena of the Ice age.

ELECTRO-CHEMICAL sciences and industries will shortly have their own technical journal. The *Electro-Chemist and Metallurgist* will make its appearance on January 15, 1901, and will do its best to keep chemists and manufacturers informed as to the progress of knowledge of electro-chemistry and practical developments. The journal will be published monthly by Messrs. Sherard Cowper-Coles and Co., Ltd., Westminster.

A MONTHLY record of the progress of anthropological science is about to be established by the Anthropological Institute, and will appear under the title of *Man*. Its contents will include contributions to physical anthropology, ethnography and psychology; the study of language, and the earlier stages of civilisation, industry and art; and the history of social institutions and of moral and religious ideas. These various branches of study will be treated more fully, in proportion as they are less adequately provided for in existing periodicals. Special note will be taken, throughout, of investigations which deal with the origins and the earlier stages of those forms of civilisation which have eventually become dominant, and of the races among which they have arisen and developed.

AT a meeting of the Scientific Committee of the Royal Horticultural Society, on December 4, a curious "Weeping Chrysanthemum" was shown. The plant was one of eleven seedlings from a cross raised by Mr. Austen, Ditting Court, Maidstone. The peculiarity of all eleven plants consisted in the downward geotropic direction of the branches, which were bent like those of a Weeping Ash, but upturned heliotropically at the ends, where flowers are produced. Dr. Masters showed a drawing of seedlings of *Leucodendron* raised by him and presenting a curious outgrowth from the caulicle (hypocotyl), similar to that in the Pea.

THE U.S. *Monthly Weather Review* for July last contains an interesting article on fog studies on Mount Tamalpais, a little to the north of San Francisco, by Mr. A. G. McAdie. The paper is accompanied by photographic illustrations of (1) fog over the Golden Gate, taken from the Weather Bureau Observatory on the above mountain; (2) fog streaming in from the Pacific; and (3) valley fog, originally sea fog, but augmented by radiation about sunset. The locality is well chosen for the study of the formation of fog; from May until September, during which time scarcely any rain falls, great banks of fog invade San Francisco with clock-like regularity every afternoon, while it is known that at some 1500 feet above the air is clear, and 20° or 30° warmer. The mean relative humidity on the mountain is 59 per cent., while at San Francisco it is 83 per cent. It is worthy of note that during the summer of 1899 a difference of temperature of 44° was recorded within so short a distance as 25 miles between Mount Tamalpais (the warmer station) and Point Reyes. The Weather Bureau maintains a regular fog service at San Francisco, and the extent and character of the fog in the roadstead and neighbouring localities are made known by means of frequent reports.

WE have received a copy of the Report of the Meteorological Commission of the Cape of Good Hope for the year 1899. There have been in operation during the year (or some part of it) about 450 stations, including the observatories at the Cape and at Kenilworth, near Kimberley; of this number 364 stations observe rainfall only. About 23 per cent. of the returns are incomplete, owing chiefly to the effects of the war. The observer at Kenilworth (Mr. Sutton) continued his observations all through the siege of Kimberley, although this station was situated outside the lines of defence, and, owing to his courage, the important records for the year are unbroken. It has been found that the old pattern Stevenson thermometer screen formerly used in this country does not sufficiently protect the instruments from the intense radiation in that part of the world, and that, except during strong winds, any two spots inside the screen seldom had the same temperature. The screen adopted is an enlarged one, designed by Mr. C. L. Wragge; it is, like the new pattern Stevenson screen, provided with a double roof, with three overlapping boards in the base of the screen, and it appears to be much better adapted to the conditions prevailing in South Africa. Some interesting notes from the Report of inspection of the stations are given by Mr. C. Stewart, Secretary to the Commission.

IN the annual report of the Imperial Bacteriologist of India (Mr. Lingard) for 1899-1900, we regret to learn that a large portion of the valuable laboratory specimens, records and library was destroyed by fire last year. An outbreak of a disease clinically resembling glanders, but differing from the latter (a) in not reacting with mallein, and (b) in the absence of the *Bacillus mallei*, is described and identified as "lymphangitis epizootica" of Rivolta, due to a protozoon parasite. The greater portion of the report deals with experiments conducted with regard to rinderpest. Animals vaccinated by injections of blood and of bile of diseased beasts were found to be fully protected nearly two years after the inoculations. Animals may be inoculated with increasing amounts of virulent blood, and then yield a serum which will protect against rinderpest, and a rapid method of immunising is described. The immunity produced by an injection of serum is, however, transient; and in order to produce a lasting or "active" immunity, recourse must be had to inoculation with virulent blood. But this is a risky operation, a considerable proportion of the beasts so inoculated dying; and, in order to avoid this, a preliminary injection of the immunising serum is given followed by the virulent blood. The amount of the serum used must be small, sufficient to ward off serious symptoms but not to prevent a transient illness; otherwise the immunity would be "passive," and not a lasting one.

A NOTABLE instance of "discontinuous distribution" is recorded by Prof. W. M. Wheeler in the *American Naturalist* for November. It appears that in 1886 a very remarkable and aberrant arachnid was described from Sicily under the name of *Koenenia mirabilis*; this creature showing a superficial resemblance to the whip-scorpions, although representing an entirely distinct group by itself. During the past spring Prof. Wheeler collected in Texas an arachnid which, on examination, proved to be specifically identical with the Sicilian form. In Sicily, *Koenenia* was found in association with species of the genera *Japyx*, *Campodea*, *Scolopendra*, and *Pauropus*; and, with the exception of the last, it occurs in Texas in company with representatives of the same genera. The European and American species of these genera are, however, distinct. Prof. Wheeler cannot admit that the *Koenenia* was introduced, and he regards it as the survivor of a very ancient fauna. An analogous case is presented by the occurrence of *Protophyx stylifer*, a primitive thysanurid insect, in Liberia and Argentina.

IN the *American Naturalist* Prof. Wheeler describes a new genus of insect living commensally with certain ants. The general reader will, however, be specially interested in the so-called "mushroom gardens" formed by the ants in question. It appears that they cut and transport into their subterranean cellars large pieces of leaves, which are there divided into smaller fragments, and ultimately reduced to a fine pulp. "This pulp is heaped up, and soon becomes invaded by the mycelium of a fungus. The mycelium is kept aseptically clean—i.e. free from all species of fungi and even from bacteria—and induced to grow in an abnormal way by bringing forth minute swellings which constitute the only food of the ant colony. Möller likens these swellings to the 'kohlrabi' of the German kitchen gardens."

THE U.S. Department of Agriculture has published a *Bulletin*, by Dr. L. O. Howard, describing the principal insects affecting the tobacco plant. Although indigenous to America, this plant does not suffer so severely from insect attacks as do many other crops in the United States. It has no insect enemies peculiar to itself, although every year a certain amount of damage is done to the crop, which in some seasons may assume serious proportions. Remedial agencies in the form of poisons can be easily applied to the seed-beds, while arsenical spray may be employed at a later stage. Much good can also be effected by means of various solanaceous plants, such as nightshade, horse-nettle, and *Datura*, growing in the neighbourhood of the crop. Small clumps of these can be left growing, which will attract the noxious insects while the tobacco is still young, such clumps being subsequently cut down and destroyed with the pests upon them.

THE Trustees of the Indian Museum have issued a "Guide to the Zoological Collections exhibited in the Bird Gallery," by Mr. F. Finn. The author is so well known as an authority on Indian birds that any contribution from his pen on the subject cannot fail to be of value. But he has departed from the usual practice of ornithologists by relegating the groups generally termed "orders" to the rank of "suborders," thereby rendering avian classification much more in harmony with that of other vertebrate classes. He also refrains from adding the superfluous affix "*formes*" to such subordinal groups. While in every respect admirably suited to the special purpose for which it is intended, this "Guide" has, therefore, a value considerably exceeding that attaching to the majority of publications of a similar nature.

WE have received Parts vii. and viii. of "Papers from the Harriman Alaska Expedition," now in course of publication in the *Proceedings* of the Washington Academy of Sciences. Both are from the pen of Mr. T. Kincaid, and deal with entomology. Although the collection of insects and arachnids is very large indeed, it indicates that, with the possible exception of the beetles, which were previously collected during the Russian occupation, scarcely a beginning has been made towards bringing to light the arthropod fauna of this vast region. Mr. Kincaid commences with an account of the insects known as Tenthredinoidea, of which he describes a number of new forms. His second communication deals with the metamorphoses of certain beetles.

IN an article on Lepidoptera in South Devonshire, which appears in the December issue of the *Entomologist*, Mr. J. Jäger states that he never saw the clouded yellow butterfly in such profusion as in the week following August 15. They were simply swarming in the clover fields and lanes, and were probably as numerous as in 1877. Two plates of hybrid moths illustrate the continuation of the account of experiments on cross-breeding by Prof. Max Standfuss in the same issue.

AMONG other papers, the November issue of the *Journal* of the Quekett Microscopical Club contains one by Mr. A. A.

Merlin, on "Structural Division of the Endoderm in Bacilli of the Bubonic Plague," which ought to prove of considerable interest to students of that disease at the present time.

THE December number of the *Entomologist's Monthly Magazine* contains a communication from Baron C. R. v. d. Osten Sacken, in which it is pointed out that the proper title of the malaria-producing mosquito is *Anopheles maculipennis*, and not, as has been generally supposed, *A. claviger*.

THE distinctive peculiarities of the skull of the puma forms the subject of a note by Dr. A. Dugés in the last issue of the *Memorias y Revista de la Sociedad Científica* "Antonio Alzate."

THE Anthropological Society of Paris has just published an authors' and subject index of all publications issued by it since its foundation in 1860.

MESSRS. A. GALLENKAMP AND CO. have issued a bulky and comprehensive catalogue of chemical apparatus, balances and accessories of various kinds used in the teaching of chemistry and related subjects and in practical analysis. The catalogue is one which may with advantage be kept for reference by science demonstrators and teachers.

THE third edition, revised and enlarged, of "An Elementary Treatise on Dynamics, containing Applications to Thermodynamics," by Dr. B. Williamson, F.R.S., and Dr. F. A. Tarleton, has been published by Messrs. Longmans, Green and Co. The whole work has been revised and some portions of the subject have been developed, more especially that on generalised co-ordinates in connection with Lagrange's and Hamilton's methods. Students intending to devote serious attention to the study of dynamics will find the volume a helpful introduction to the great treatises of Thomson and Tait and of Routh.

AN elaborate "Report on the Census of Cuba," by Lieut.-Colonel J. P. Sanger (Director) and Messrs. H. Gannett and W. F. Willcox (Statistical Experts), has just been published by the U.S. War Department. The census was the first step taken towards the establishment of an effective system of self-government in the island, and as no census had previously been taken by the people the difficulties were numerous and great. To induce the Cubans to take a real interest in the census, it was decided that the work should be performed by them, under the supervision of an officer of the United States Census, and this was actually done, so that when the enumeration was completed it was a census of Cubans by Cubans. The total population of Cuba, including the Isle of Pines and the neighbouring islets, was 1,572,797 on October 16, 1899. At a census taken under Spanish authority in 1887, the population was returned as 1,631,687, and if this is assumed to be correct, the diminution during the twelve intervening years is about 3.6 per cent. The native whites constitute 57.8 per cent., or considerably more than one-half of the population of Cuba; the foreign white people constitute 9 per cent.; the coloured people 32 per cent., or about one-third; and the remainder are Chinese. Illustrations of typical Cuban people and buildings, and numerous maps are included in the report.

READERS of popular periodicals know that articles upon scientific topics appear in every number of *Pearson's Magazine*. The December number contains several contributions of this character. The Rev. H. N. Hutchinson describes some prehistoric animals and illustrates them with some good pictures. Special mention is made of the giant ground sloth of Patagonia, for a living representative of which Mr. H. Prichard is seeking, having been sent to Patagonia for this purpose by the *Daily Express*. A number of striking coloured portraits of American Indians, showing the devices painted upon their faces, as marks



of distinction, accompany an article by Mr. T. Dreiser. The marble quarries at Monte Sagro, in the vicinity of Carrara, are described and illustrated by Mr. E. St. John Hart. Two series of photographs of a cat and dog jumping over an obstacle are contributed by Mr. A. C. Banfield. Dr. See's views upon the mode of formation of stellar systems are expounded in another article. Mr. George Griffith describes the line where the day changes, near the 180th degree of longitude, making it the text of an article upon the places where the twentieth century will commence; and Mr. Walter Wellman describes some of his Arctic experiences. Six pretty photographs of birds are reproduced in the *English Illustrated Magazine*.

THE use of gas thermometers at high temperatures is the subject of an interesting paper by Messrs. Holborn and Day (*Wied. Ann.* 68, 817). Experiments with porcelain vessels, glazed and unglazed, have shown that this material is unsuitable for the construction of the containing vessel, especially when the gas used is hydrogen. Platinum iridium vessels (10 or 20 per cent. Ir) containing nitrogen appear to be very trustworthy; after the thermometer has been heated to 1100° C. for a considerable time, the indications of the instrument at low temperatures remain unaltered. The thermo-elements usually employed for the measurement of high temperatures have been carefully compared with this gas thermometer, and the electromotive force represented as a quadratic function of the temperature. With these thermo-elements the melting-points of a series of metals have been determined, so that the calibration and control of other elements is made independent of the standard nitrogen thermometer. The authors claim that the error in the determination of high temperatures (up to 1150° C.) does not exceed 1° C. The influence of air on the melting-points of copper and silver is interesting, as is evident from the following numbers—copper (pure) 1084.1° C., (in air) 1064.9° C.; silver (pure) 961.3° C., (in air) 955° C.

WE learn from the Marine Biological Laboratory at Plymouth that a male specimen of *Squilla desmarestii*, 2½ inches long, was brought in last week by a shrimper who had been trawling inside Plymouth Breakwater. The rarity of this Stomatopod in Devonshire waters is shown by the fact that this is only the second specimen that has been taken at Plymouth since the laboratory opened in 1888, the other, a small one ¼-inch long, having been taken in the tow-net about three years ago.

THE additions to the Zoological Society's Gardens during the past week include two Puff Adders (*Bitis arietans*), a Yellow Cobra (*Naia flava*), two Delalande's Lizards (*Nucras delalandii*), thirty-two Spotted Slow Skinks (*Acontias meleagris*), three Rough-necked Snakes (*Dasypeltis scabra*) three Smooth-bellied Snakes (*Homalosoma lutrix*), three Crossed Snakes (*Psammophis crucifer*), five Rhomb-marked Snakes (*Trimerorhinus rhombeatus*), two Coppery Snakes (*Prosymna sundevalli*), a Lineated Snake (*Boodon lineatus*) from South Africa, presented by Mr. J. E. Matcham; six Yellow-legged Frogs (*Rappia horstockii*) from South Africa, presented by Mr. W. L. Sclater; a Black Rat (*Mus rattus*), British, presented by Mr. E. Wormold; two Bactrian Camels (*Camelus bactrianus*, ♂ & ♀) from Siberia, a Moose (*Alces naehlis*, ♂) from North America, two Ashy-black Macaques (*Macacus ocreatus*) from the East Indies, a Golden-headed Marmoset (*Midas chrysomelas*) from South-east Brazil, a Red-footed Lemur (*Lemur rufipes*) from Madagascar, a Rufous-necked Wallaby (*Macropus ruficollis*) from New South Wales, four Westernman's Eclectus (*Eclectus westernmani*) from Moluccas, a Plain-coloured Amazon (*Chrysotis inornata*) from South America, a Mongolian Pheasant (*Phasianus mongolicus*, ♂) from Mongolia, a Blackbird (*Turdus merula*, pied. var.), European, deposited.

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## OUR ASTRONOMICAL COLUMN.

LOCAL CONDITIONS FOR OBSERVATION OF THE TOTAL SOLAR ECLIPSE, 1901, MAY 17-18.—A pamphlet has been received containing information for observing parties and summaries of the climatological conditions along the track of the moon's shadow during the total solar eclipse in May 1901. The work is the report of a committee of the society, Koninklijke Natuurkundige Vereeniging in Nederlandsch-Indië, appointed at the request of the Government at Batavia.

With the exception of Batavia, which is out of the eclipse track, there is no regular meteorological service in the Malay Archipelago. Regular observations of rainfall, however, have been made during the period 1879-1900 at about 220 different places. As this factor alone does not give sufficient evidence as to the suitability of a place for observation of a total solar eclipse at noon, special series of climatic data have been obtained during the months of April, May and June 1900, in several places well situated for the purpose.

Twenty-two stations have been selected, extending from Padang, on the west coast of Sumatra, to Amboyna and Saparua, at the eastern extremity of the Celebes group. Tables are given showing the cloudiness of the sky, mean rainfall, daily and hourly rainfall.

As regards general condition of sky during May, the west coast of Sumatra appears to have the worst reputation, the percentage clearness being only 28 per cent., as against 50 per cent. for the Macassar Sea between Borneo and Celebes.

As regards rainfall, the western stations are apparently the better, Padang averaging fifteen rainy days in May, while at Amboyna there are twenty-seven. The actual rainfall is little or no indication of weather condition, as excessive rains do not involve a period of clouded sky; on the contrary, the atmosphere is cleared from dust by heavy rains, so that in the rainy season the sky is much more transparent than during the dry season. Several suggestions with respect to the accommodation at the various localities may be useful to observers.

The most convenient stations will probably be on the west coast of Sumatra. Padang is the residence of the Governor. In weekly communication with Europe, has a telegraph office and four hotels.

Painan is situated south of Padang on the sea shore; it has no harbour, but is easily reached by land from Trusan Bay, where there is good anchorage.

Solo, in the interior, at an elevation of 1300 feet above sea-level, has a telegraph office and small hotel, and is connected with Padang by rail.

Pulo Lalang, an islet of the Lingga group, lies close to the central line, and possesses good anchorage for small vessels, which could be hired at Singapore.

Pontianak, on the west coast of Borneo, is in direct communication with Singapore once or twice weekly. It has a small hotel. The soil is said to be very swampy and unsuitable for large instruments.

Macassar, the capital of Celebes, has a telegraph office and two hotels, and is in direct communication with Singapore once a week.

Amboyna and Saparua are only in communication once or twice a month unless with special service.

As soon as a station is selected, arrangements should be made for securing the support of the civil officials, application being made in the first instance to the Governors or Residents. For temporary establishments bamboo and other materials are obtainable on the spot, and are inexpensive. Skilful craftsmen are not available except in the principal places. Portland cement may be purchased at Padang, Batavia, Surabaya and Macassar. No Customs duties are levied on instruments in the Dutch Colonies.

"ANNUAIRE ASTRONOMIQUE, &C., FOR 1901."—This well-known little annual volume, which is compiled by M. Camille Flammarion, will be found as useful as ever for the coming year. One finds in it all the more important details and events of celestial phenomena. Thus, we are given the facts about the coming solar and lunar eclipses, the chief tables of the solar system, charts of the sky for each month, showing the paths and positions of the planets. Further, there are several short notices on such subjects as solar spots, atmospheric observations, the eclipse of 1900, meteor observations, terrestrial magnetism, meteorological tables, &c. As a handy *vade mecum* for those who possess and use small equatorials, this annual should be specially very welcome.